Software, Software License Rights, and the Army Software Sustainment Perspective

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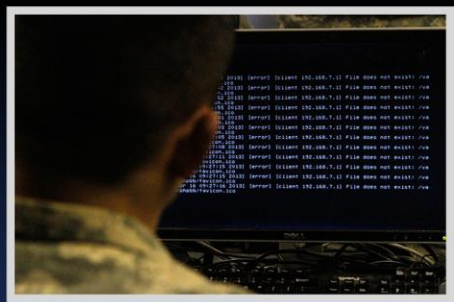


VISION

A trusted high performing team who lives the Army values and delivers software to enable the Expeditionary Army

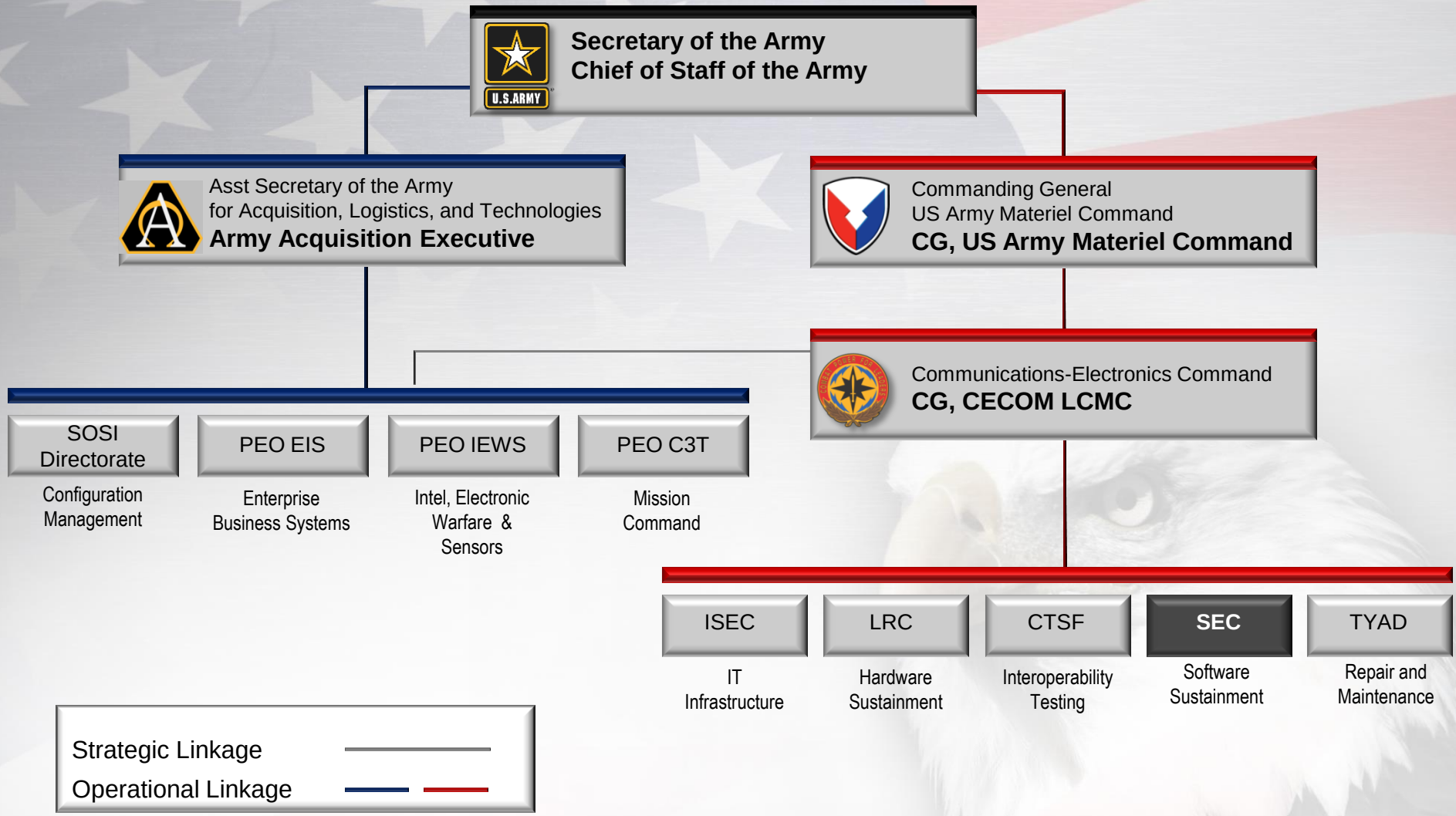
MISSION

Ensure operational readiness by developing, providing, integrating and maintaining Army C4ISR, Logistics and Business software

Core Competencies

- Software Acquisition Support
- Software Development
- Software Testing
- Cybersecurity
- Independent Verification & Validation
- Software Field Support
- Data Strategy
- Electronic Warfare Software Reprogramming

OUR ARMY TEAM



Key Customers Supported

Program Acquisition

PEO IEW&S

PEO C3T
PROGRAM EXECUTIVE OFFICE COMMAND CONTROL COMMUNICATIONS TACTICAL

PEO EIS
PEO Enterprise Information Systems

System of Systems Engineering & Integration Directorate

Program Executive Office Missiles and Space

Program Executive Office Aviation

HQDA

EMDS
Enabling Army Enterprise Document Solutions

Deputy Chief of Staff, G-4
United States Army

Chief Information Officer (CIO) G-6
United States Army

General Counsel of the Army

DoD

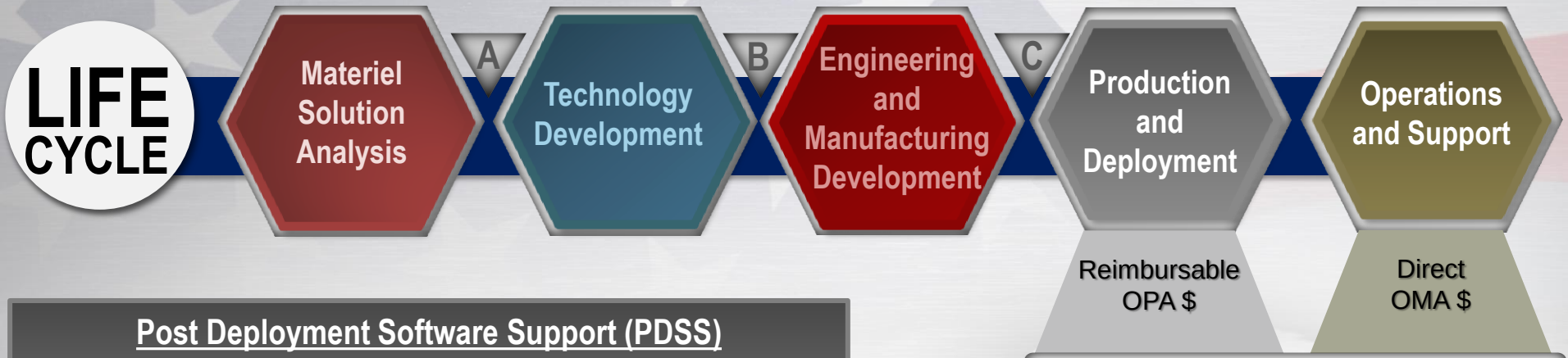
Defense Health Agency
Department of Defense

WHAT IS SOFTWARE SUSTAINMENT?

The processes, procedures, people, materiel, equipment, facilities and information required to support, maintain and operate a system's software

- Resolve anomalies preventing mission accomplishment
- Modify software to support operational needs or environment
  - Responding to new threats or requirements
  - Maintaining interoperability with other changing systems
  - Accommodating new weapons, systems or munitions
- Perform Software Tech Assist (Field Software Engineers)
- Acquire & manage COTS software licenses
- Incorporate fixes to address Information Assurance Vulnerability Alerts (IAVAs)

SOFTWARE SUSTAINMENT IN THE ACQUISITION LIFECYCLE



Post Deployment Software Support (PDSS)

Starts from the point a system is provided to the First Unit Equipped (FUE) to the end of production or when software increment fully fielded (hardware production line may continue). Funding is the responsibility of the PM and generally funded with OPA or OMA.

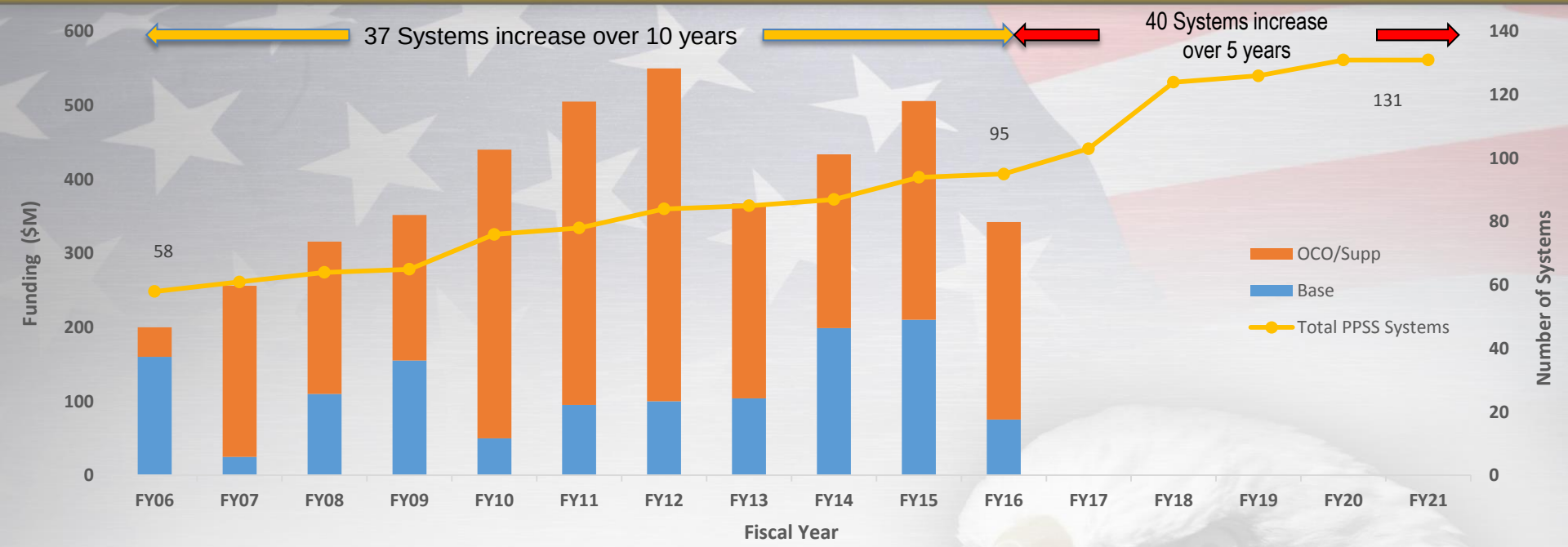
Post Production Software Support* (PPSS)

Starts first year after production or for a software increment when that increments is fully deployed until item divested by the Army. Funded with OMA from Depot Maintenance (Army G4) accounts.

Software maintenance efforts entail similar software activities but have programmatic differences

* PPSS is also referred to as Software Depot Maintenance

PPSS FUNDING COMPARED TO NUMBER OF SYSTEMS



Systems entering PPSS Sustainment and Retiring

	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16
Total PPSS Systems	58	61	64	65	76	78	84	85	87	94	**95**
New Systems		4	8	6	18	5	6	4	3	9	3
Retired Systems		1	5	6	7	3	0	3	1	2	2
		EPLRS	AFATDS	A2C2S	ANCDS COE	DCGS-A F-MFWS	AFSB	AWS	ATNAVICS	AKMS-LCMS	AN/APR-39C(V)1	SGF
		GSCCE	BCS3	AN/TRR 38	CPP	DCGS-A CDSS	JNMS	CMWS	CSEL	AKMS- SKL	AN/APR-39C(V)2	AN/TPQ-50
		ICC	CENTAUR	39B(V)2	DMS	DCGS-A TGS	SDIN	HSTAMIDS	JADOCS	BFT-A	GCCS-A	TIGR
		RFIS	CHIMS	SCL	EBEM	DCGS-A OGS	SIF	JTT/IBS	JMOS	TRR-38	HCCC	RC-12
		SGF	GDU-R	UPT	GRCS	DCGS-A Common	SSSv4	KaSTARS	FF-Q36 TD		HMS	AN/APR 39(v)2
			GSC-52MOD	WIN-T	RHN	DCGS-A Fixed	DMS	SACE	FF-Q37 TD		LRAS3	
			MMS-P	ASAS-L	SSSV1	DCGS-A P-MFWS	NOC-V		SSSv1		SINCGARS	
			PFED	DTSS	DCGS-A GWS	DCGS-A IFS	TMS				TMC	
			AMDS	ISYSCON V1/V2	DCGS-A IPC-1	DCGS-A IPC-2					WRMS	
			ASAS-AS	JTIDS	ASAS-CCS	ESSO/KSSO					AN/TPQ-48	
			DFCS	MMS	BSN	ETW					HSTAMIDS	
			IMPCS		BBN	IREMBASS						
			GNN			MSE						

PPSS Cost – FY15

Software Sustainment Centers	AMRDEC	AMCOM	**CECOM**	TARDEC	ARDEC
FY15 Cost	$3.7M	$22.7M	**$440.9M**	$2.3M	$4.9M

Key Elements:

- 231 Software Releases resolving 8420 requirements in support of 94 systems:
  - System Software Changes - **$114.7M**
  - COTS Licenses - **$82.6M**
  - Information Assurance Vulnerability Alerts (IAVAs) - **$33.6M**

Modes of Software Sustainment

- Sole Source Contractor Supported Software Sustainment
  - In the Field, Contractor Facility, or an Army Depot
- Competitive Contractor Supported Software Sustainment
  - In the Field, Contractor Facility, or an Army Depot
- Organic Software Sustainment
  - By Soldiers or Army Civilians
  - In the Field or at an Army Depot
- Hybrid of Contractor Sustainment and Organic Sustainment

Factors that Influence Mode of Sustainment

- Guidance that promotes organic sustainment or promotes limits upon contractor sustainment support (e.g., 10 USC 2464, 10 USC 2466, 10 USC 2474)
- Mission Readiness (Time-Effectiveness)
  - Which mode of sustainment will better meet mission deadlines? Which mode may compromise mission readiness?
- Cost-Effectiveness
  - Does the Government have the software source code, other critical software tools, and documentation necessary for software sustainment?
  - Does the Government have sufficient software license rights to distribute the software to contractors for competitive procurement of software sustainment?
  - If the necessary software/software license rights can be purchased, is this approach feasible or prudent from a cost perspective?

Cost-Effectiveness and Mode of Sustainment

- Software sustainment is a significant portion of the life cycle cost of a program
- Sustainment *traditionally* represents about 70% of a weapon system's life-cycle costs [GAO-14-778 Report]
- Sustainment Costs for **commercial** software systems range between 40 and 75 percent of total life-cycle costs. [Lientz and Swanson, 1980; Boehm, 1981]
- Software sustainment comprises between 40 percent and 90 percent of total life-cycle software expenditures. [Bennetti, 1997]

Competition Enhances Cost-Effectiveness

- Some researchers observed a 25% reduction in costs due to competition [Carter, 1974].
- However, there is significant variance between such studies that compare reduction in costs due to competition. [Washington, Acquisition Review Quarterly, 1997]

Study	Mean Percentage of Reduction in Cost Due to Competition
CARTER	25%
OLSON	13.5%
ZUSMAN	37%
LOVETT	17%
DALY	35%
DRINNON	41.9%
AVERAGE:	28.2%

- These studies show significant cost avoidance savings from competition (versus sole source procurements).
- CECOM's software sustainment community regularly participates in acquisition planning with PEO customers (at earlier program milestones) to facilitate future organic sustainment or future competitive procurement of software sustainment

Lack of Data and Data Rights Results in Sole Source Contracts

- One DOD IG study examined 23 sole source contracts (with a total of $1.75B in obligated funds) and 15 of these sole source contracts (with a total of $1.66B in obligated funds) cited data rights issues as the justification for the sole source contract. [DOD IG Report No. 2012-084]
- In a similar study of ACC-APG contracts, 62 out of 248 FY 16 contracts (25%) cited data or data rights issues as a justification for other than full and open competition. These 62 contracts account for approx. $1.25B out of approx. $3.7B (≈ 34%) of obligated funds.
- Bottom Line: A significant percentage of sole source contracts are due to a lack of Data and Data Rights

Cost-Effectiveness and Organic Sustainment

- Where feasible, organic sustainment reduces costs by relying on Government personnel and/or Government facilities
- To further demonstrate the cost-effectiveness of organic software sustainment, SEC is conducting manpower studies which evaluate the cost benefit of using organic personnel rather than contractors to perform PPSS core capabilities
- This study may be used to further encourage organic software sustainment efforts by providing a clear case study that demonstrate the positive impact on cost and mission readiness
- Key Points of Manpower Initiative:
  - **Readiness:** Critical, organic, core, technical industrial base in support of weapon system software life cycle
  - **Capacity:** Agile capability that meets the requirements now and into the future
  - **Efficiency:** Projected cost savings of $55M+ over 5yrs
  - **Quality:** Environment of technical excellence and innovation
  - **Core capability:** Provides an effective, efficient and highly responsive enterprise with the resources, skills, and competencies necessary to sustain the software life-cycle readiness of Army weapon systems

Panel Questions

- **Should the technical data rights statutes explicitly refer to computer software?**
  - Software and software license rights are vital to the Army sustainment community.
  - The policies behind 10 USC 2320 highlight the importance of technical data in the support and sustainment of DOD systems.
  - For these same policy reasons, 10 USC 2320 should also include provisions that set clear statutory minimums/standards with the respect to software license rights
  - In particular, 10 USC 2320 should be revised to set minimum software license rights with respect to software test data and interface control documents

Panel Questions (cont.)

- **Is the treatment of software adequately covered in the DFARS? What gaps in the DFARS software provisions should the panel be addressing? What proposed solutions do you recommend for the statutes/DFARS?**
  - Some provisions in DFARS 252.227-7014 do not adequately address the needs of the software sustainment community
    - Under a “Restricted Rights” license rights provision, the Government may “use a computer program with one computer at one time. The program may not be accessed by more than one terminal or central processing unit or time shared unless otherwise permitted by this contract”
    - Broader software license rights are needed to facilitate software testing, support, and sustainment **by or on behalf of the Government**. Options for addressing the needs of the software sustainment community:
      - Revisions to the “Restricted Rights” license that permit additional copies by and on behalf of the Government for sustainment purposes?
      - New license rights provisions specifically for source code under “Restricted Rights” category to facilitate Government and support Contractor software sustainment?
      - New category of software license rights that is specifically designed for source code for software sustainment?
      - New category of license rights for commercial computer software?

Panel Questions (cont.)

Broader Software License Rights For Sustainment:

DFARS 252.227-7014(a)(15): “Restricted rights” apply only to noncommercial computer software and mean the Government's rights to—

(i) Use a computer program with one computer at one time. The program may not be accessed by more than one terminal or central processing unit or time shared unless for sustainment purposes or otherwise permitted by this contract;

(ii) Transfer a computer program to another Government agency without the further permission of the Contractor if the transferor destroys all copies of the program and related computer software documentation in its possession and notifies the licensor of the transfer. Transferred programs remain subject to the provisions of this clause;

(iii) Make the minimum number of copies of the computer software required for safekeeping (archive), backup, or modification purposes;

(iv) Modify computer software provided that the Government may—

(A) Use the modified software only as provided in paragraphs (a)(15)(i) and (iii) of this clause; and

(B) Not release or disclose the modified software except as provided in paragraphs (a)(15)(ii), (v), (vi) and (vii) of this clause;

(v) Permit contractors or subcontractors performing service contracts (see 37.101 of the Federal Acquisition Regulation) in support of this or a related contract to use computer software to ~~diagnose and correct deficiencies in a computer program~~ use or modify the computer program for sustainment purposes, to modify computer software to enable a computer program to be combined with, adapted to, or merged with other computer programs, or when necessary to respond to urgent tactical situations, …”

Panel Questions (cont.)

- **Is the treatment of software adequately covered in the DFARS? What gaps in the DFARS software provisions should the panel be addressing? What proposed solutions do you recommend for the statutes/DFARS?**
  - The DFARS should more clearly define the term “lowest practicable level” with the respect to private expense determinations for non-commercial software.
    - DFARS 227-7203.4 provides the following guidance: “(b) Source of funds determination. The determination of the source of funds used to develop computer software should be made at the lowest practicable segregable portion of the software or documentation (**e.g., a software sub-routine that performs a specific function)**. Contractors may assert restricted rights in a segregable portion of computer software which otherwise qualifies for restricted rights under the clause at 252.227-7014, Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation.”
    - The DFARS policy guidance and clauses should clearly define the lowest practicable level at no lower than the an individual software program written in a high-level programming language that can be compiled or debugged **(i.e., not at the single line of code level)**.

Panel Questions (cont.)

- **What software deliverables/rights problems are encountered at SEC? How have you resolved them?**
  - **Problem:** Obtaining Source Code and other software tools/documentation (e.g., build scripts, operating environments, libraries, development kits, and special compilers) that are critical to software sustainment
    - Without the aforementioned critical software tools, it is difficult to implement software engineering process improvements during sustainment (which improve quality, testing, system operational effectiveness, and relevance to enduring and future requirements)
    - **Solution:** SEC participates in acquisition planning with PEO customers at earlier milestones. In particular, SEC encourages PEO customers to require delivery of source code (at milestones when development and competition are still occurring), in order to facilitate organic software sustainment or competitive procurement of software sustainment
  - **Problem:** Determining whether the Government has secured the software license rights to which it is entitled
    - **Solution:** SEC now requires IP Workgroups to review upcoming and existing contracts to better leverage Data and Data rights and resolve Data and Data Rights issues in current contracts
  - **Problem:** Cost of Commercial Software Licenses
    - **Solution:** Increasing emphasis on Enterprise License Agreement, in order to realize cost avoidance savings from volume discounts

Panel Questions (cont.)

- **What software deliverables/rights problems are encountered at SEC? What proposed solutions do you recommend for the statutes/DFARS?**
  - **Problem:** Vulnerability Issues related to Lack of Source Code
    - For commercial software, the Government *often* does not have software source code. Without the source code, the Government is often at a disadvantage with regard to analyzing and removing vulnerabilities of such software (in comparison to instances where Government has non-commercial software source code).
    - **Proposed Solution:** The Government should consider revising the following guidelines at DFARS 227.7203-1 (and similar provisions in 10 USC 2377 related to preferences for commercial items), in order to give the Government greater flexibility in source selections:
      - "Offerors and contractors shall not be prohibited or discouraged from furnishing or offering to furnish computer software developed exclusively at private expense solely because the Government's rights to use, modify, release, reproduce, perform, display, or disclose the software may be restricted."

CONCLUDING REMARKS